

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested. The indication of allowability of claims 3 and 12 is appreciated. These claims have been rewritten into independent form and should be in clear condition for allowance.

The rejection of claims 1, 2, 4-11 and 13 under 35 U.S.C. §103 as allegedly unpatentable over newly cited Moore, III (US Patent 6,148,021) and Kumar '894 (US Patent 6,005,894) is respectfully traversed.

Applicant's claims are directed towards method or apparatus for generating or decoding a spread spectrum signal. Claim 1, for example, is a method in which : (i) a complex spreading signal is generated; (ii) the complex spreading signal is phase-shifted in accordance with a Hilbert transform; (iii) **the complex spreading signal and the phase-shifted complex signal are up-converted to a higher frequency to produce a single side band (SSB) spread spectrum signal**; (iv) band limiting one of the complex signals or the SSB spread spectrum signal, and (v) modulating one of the complex signals or the SSB spread spectrum signal after the up-conversion step.

Moore III does not disclose limitations of the claimed invention including: phase shifting a complex signal in accordance with a Hilbert transform or up converting both a complex spread signal and the phase shifted complex signal to produce a SSB spread spectrum signal. There is also no suggestion, motivation or teaching evident from the

prior art that would lead a person of ordinary skill to modify Moore III to phase shift with a Hilbert transform or to convert both a complex spread signal and a phase shifted complex signal. The disclosure in Kumar '894 of applying the Hilbert transform to a monophonic audio input signal is not a teaching of applying the transform to a complex spreading signal. Further, there is no teaching in Kumar '894 of converting both a complex spread signal and a phase shifted complex signal. Accordingly, the claimed invention would not have been obvious in view of Moore III and Kumar '894.

Moore III does not disclose up converting both a complex spreading signal and a phase shifted complex spreading signal as required by method claim 1. Contrary to the Action at page 3, lns. 5-8, Moore III does not disclose converting these two signals at col. 3, lns. 30-49 ("The output of filter 106 is then applied to one terminal of mixer 108 and suitably up-converted, as determined by the carrier frequency F_c , applied to its other terminal." – this disclosure does not suggest that two signals are up-converted); at col. 5, lns. 55-64 ("The output of filter 710 undergoes single-sideband demodulation in SSB demodulator 712, using a reference signal having a constant frequency equal to the chip rate" – this disclosure relates to reception of a signal and does not suggest that two signals are down converted); col. 7, lns. 34-37 ("up converting the spread signal before transmission" – this disclosure does not suggest that two signals are upconverted).

Moore III also does not disclose a complex modulator connected to receive both a complex spreading signal and a phase shifted complex spreading signal, as required by claims 7 and 13.

Moore III is designated as "defining the generate state of the art which is not considered to be of particular relevance" (an A reference) in the PCT International Search Report dated April 10, 2000. It is a bit surprising that Moore III is being applied for the first time to reject the claims given that the reference was previously determined to be of no particular relevance and was cited in a search report six years ago.

Contrary to the Examiner's assertion, Kumar '894 does not suggest a modification of Moore III. Kumar '894 relates to a conventional narrow band system and teaches various techniques for creating a composite of additional information bearing signal envelopes that can be transmitted along with a conventional amplitude modulated band signal envelope (i.e., such that the entire signaling spectrum fits within the narrow band frequency "mask" allocated by the FCC to a conventional AM commercial radio station). Kumar's use of the Hilbert Transform filter is not related to generation of any spread spectrum signal. Kumar teaches phase shifting of a complex spreading signal in accordance with a Hilbert transform to produce a phase shifted complex spreading signal at column 29, lines 13-50. However, this passage of Kumar merely relates to the Kumar embodiment of Figures 11/15 where a Hilbert transform filter 205 is used to effect a 90° phase shift of all frequency components of the input analog audio signal. That is, as

shown in Figure 11, the analog audio signal has already been converted to digital format at 57 and therefore the phase shifting involved in creating a single sideband version of this information utilizes the digital Hilbert transform filter 205 shown in Figure 15. However, the signal being phase shifted by the Hilbert transform filter 205 is the monophonic audio input signal 59 -- not a complex spreading signal. Furthermore, the output of the Hilbert Transform filter is not a phase shifted complex spreading signal. Instead, it is a phase shifted version of the audio input that is used at mixer 209 for generating one component of what will ultimately become a single sideband version of the analog audio information.

Independent claim 7 is directed towards apparatus for transmitting a single sideband spread spectrum signal and also requires, inter alia, a complex spreading signal generator, a phase shifter coupled to receive the complex spreading signal and a phase shift in accordance with a Hilbert Transform, etc. For reasons analogous to those already discussed, there is no possible teaching or suggestion of the apparatus of claim 7 anywhere in Moore III and Kumar.

Independent claim 11 recites a method of decoding a single sideband spread spectrum signal which requires, inter alia, upconverting a complex spreading signal to a higher frequency and then using that upconverted complex spreading signal to demodulate a received signal. As already mentioned, there is nothing in Moore III and Kumar about up conversion of a complex spreading signal.

Independent claim 13 is directed to an apparatus for decoding a transmitted spread spectrum signal and requires, inter alia, a complex spreading signal generator, a phase shifter connected to phase shift the output of the signal generator, a complex modulator which upconverts the complex spreading signal, etc. Once again, there is no possible teaching or suggestion of anything with respect to spread spectrum technology anywhere in Moore III or Kumar.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Jeffry H. Nelson/

Jeffry H. Nelson
Reg. No. 30,481

JHN:glf
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100